The Advanced Technology Program
In Partnership with NIST and the Nation

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Advisory Committee
March 11, 2003

National Institute of Standards and Technology
Technology Administration
U.S. Department of Commerce

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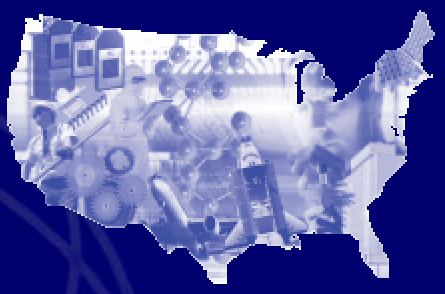
ATP Mission …

To accelerate the development of *innovative technologies* for *broad national benefit* through *partnerships* with the private sector.



The President's FY2004 Budget for ATP

Consistent with the Administration's emphasis on shifting resources to reflect changing needs, the 2004 Budget proposes to terminate the Advanced Technology Program (ATP). Funding is provided for administrative costs and close-out. The Administration believes that other federally funded research and development programs are more effective and of higher priority. Further, large shares of ATP funding have gone to major corporations which do not need subsidies. Finally, ATP-funded projects often have been similar to those being carried out by firms not receiving such subsidies.

FY2004 Budget of U.S. Government

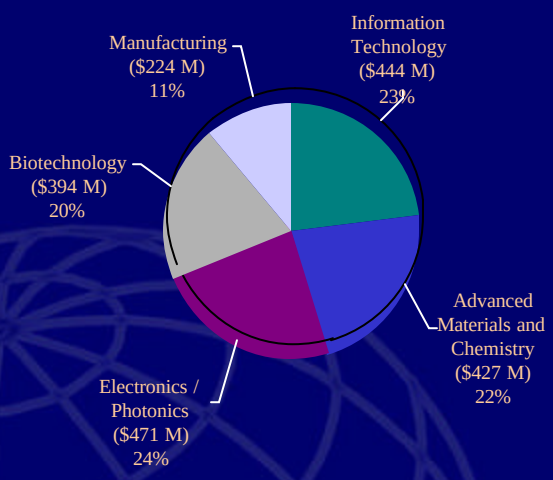
In addition, for necessary expenses of the Advanced Technology Program of the National Institute of Standards and Technology, $180,000,000, to remain available until expended, of which $60,700,000 shall be expended for the award of new grants before October 1, 2003.

Omnibus Appropriations *Signed: February 20, 2003*
Public Law Number 108-7

Thirteen Years of Innovation

- Since 1990, **5,451 proposals** submitted to **43 competitions,** requesting **$11.7 B** from ATP
- **642 projects awarded** with **1,329 participants** and an equal number of subcontractors
- **195 joint ventures** and **447 single companies**
- **$3.9 billion of high-risk research** funded
  - *ATP share = $2.0 billion*
  - *Industry share = $1.9 billion*
- Small businesses are thriving
  - *63% of projects led by small businesses*
- Over **160 universities** participate
- Over **25 national laboratories** participate

642 ATP Awards
by Technology Area
(As a Percent of $1.960 B Awarded)



Forty-three Competitions (1990 – September 2002)

Addressing a National Problem or Need

Between Invention and Innovation

An Analysis of Funding for Early-Stage Technology Development

November 2002

Evidence

- Federal funding plays a critical role in crossing "Darwinian Sea"
  - ATP represents a more important element in bridging this gap than may have been appreciated
  - VC, State Government and Universities only contribute between 8 and 16% toward early stage technology development
  - ATP and SBIR account for between 21 and 25%

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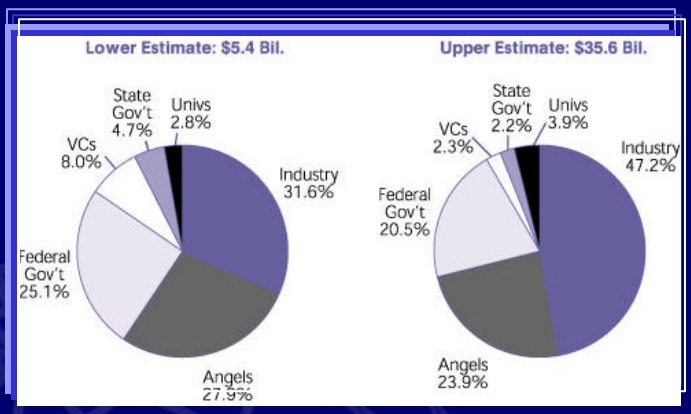
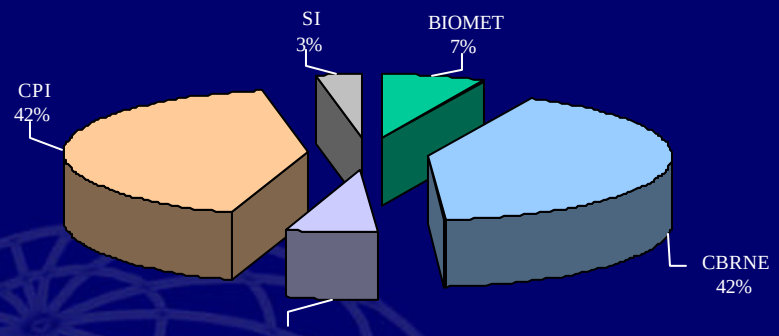
Estimated distribution of funding sources for early-stage technology development, based on restrictive and inclusive criteria



Note: The proportional distribution across the main funding sources for early-stage technology development is similar regardless of the use of restrictive or inclusive definitional criteria.

ATP Investments in Technologies Related to Homeland Security

(*data compiled over 43 competitions, 1990 – June 2002*)



- 106 projects
- $543M total investment
  - ✓ $290M ATP share
  - ✓ $254M industry share

ATP Investments in Technologies in Support of Homeland Security Relate to NIST SFAs

HOMELAND SECURITY

- **Biometrics**
- **CBRNE: Chemical/Biological/Radiological/Nuclear/Exposure**
- **CPI: Critical Physical Infrastructure**
- **TIR: Technologies for Incident Response**
- **CIP: Critical Infrastructure Protection**
- **CS: Cyber-security**
- **S&I: Surveillance and Intelligence**
- **CDM: Critical Defense Manufacturing**

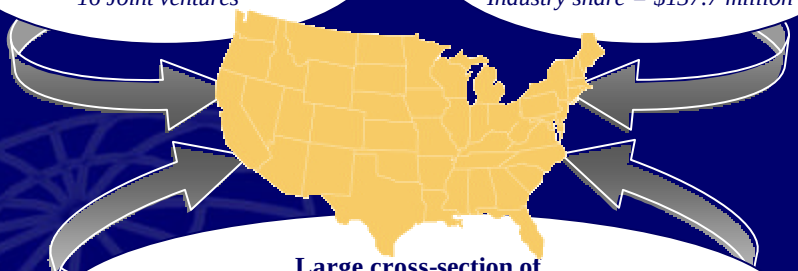
HEALTH CARE
NANOTECHNOLOGY
IT/ KM

Nanotechnology

Since 1991 …

39 ATP awards in Nanotechnology
23 Single applicants
16 Joint ventures

Over $280 million of high technical risk R&D funded
ATP share = $142.5 million
Industry share = $137.7 million



Large cross-section of participants
79 Companies, 2 Non-profits, 5 Universities
Over 100 subcontractors, including 48 universities

Ongoing Projects in Nanotechnology

Nanostructured Materials

Nanofabrication Techniques & Tools

Nanometrology

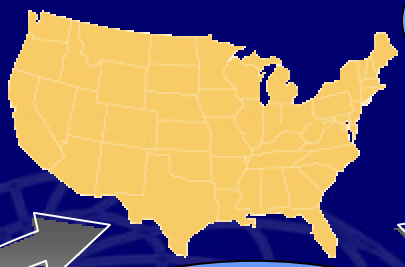
Nanoelectronics & Photonics

Nanodiagnostics

Nanobiotechnology

ATP: Strengthening America's Photonics Industry

Since 1998 …



Nearly $293 million of high technical risk R&D funded
ATP share = $147 million
Industry share = $146 million

Large cross section of participants
65 Companies, 4 Universities
Plus many subcontractors

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NIST

Ongoing Projects in Photonics

- *Optoelectronics and Lasers*
- *Sensors, Metrology & Inspection*
- *Data Storage*
- *Displays & Imaging*
- *Lighting & Illumination*
- *Bio-photonics*
- *Nanotechnology and Materials*

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NIST

ATP in Tissue Engineering

ATP awards in tissue engineering target a wide range of technologies that address treatment methodologies for many important families of disease. In addition to the high levels of mortality and the associated indirect cost of morbidity caused by these diseases, the annual financial burden of treatment in the United States is substantial.

Disease	*Estimated Annual Direct Cost of Treatment*
Diabetes	*$44 billion*
Heart Disease	*$182 billion*
Liver Disease	*$9 billion*
Lung Disease	*$65 billion*
Kidney Disease	*$18 billion*
Parkinson's Disease	*$6 billion*
Cancer	*$61 billion*
Arthritis and Osteoporosis	*$82 billion*

ATP in Tissue Engineering

- **In the field of tissue engineering, ATP has funded 51 projects; contributing nearly $100 million with corporate partnerships adding an additional $81 million.**
- **The estimated market for the regeneration of bone, cartilage, and other connective structural treatments is approximately $15 billion worldwide.**
- **The potential impact of ATP funded projects is therefore substantial. Benefits extend worldwide and into many different disciplines, including homeland security and biodefense applications.**

Low-Cost Manufacturing Process Technology for Amorphous Silicon Detectors:
Applications in Digital Mammography and Radiography[1]

General Electric Corporate R&D and PerkinElmer, Inc.,[2] developed a low-cost manufacturing process for fabricating amorphous silicon detector panels for digital mammography and radiography systems.

- Digital mammography and radiography systems are innovative technology solutions to the diagnostic and productivity limitations of conventional X-ray.
- Between 1995 and 2000, ATP co-funded the joint-venture project. The ATP provided $1.6 million; the companies provided an additional $1.9 million in cost share.

[1] A forthcoming ATP contractor study—Dr. Thomas Pelsoci, Delta Research Company, *Low-Cost Manufacturing Process Technology for Amorphous Silicon Detectors: Applications in Digital Mammography and Radiography*, (NIST GCR 03-844), 2003.
[2] Formerly EG&G Reticon.

Low-Cost Manufacturing Process Technology for Amorphous Silicon Detectors:
Applications in Digital Mammography and Radiography

Project Performance

- The new process, expected to be implemented by 2004, will reduce fabrication costs by approximately 25% without compromising performance:
  - Less complex fabrication with fewer mask steps: seven vs. eleven
  - Fewer total process steps: 200 vs. 300
- As a result of the ATP-funded low-cost manufacturing process:
  - Additional digital mammography and radiography systems are expected to be sold
  - More patients will likely experience the benefits of digital mammography and radiography
  - More health-care facilities will likely experience improved productivity and patient throughput

Project Performance (con't)

- Total Net Public Benefit to the Nation (excludes benefits to funded companies):
  - ° Net Present Value of ATP Investment: $219 million to $339 million ($2002)
- Public Return on ATP investment:
  - ° Internal rate of return on ATP Investment: 69 percent to 77 percent
- Public Benefit per ATP dollar invested
  - ° Benefit-to-cost ratio for ATP Investment: 125:1 to 193:1

Low-Cost Manufacturing Process Technology for Amorphous Silicon Detectors:
Applications in Digital Mammography and Radiography

Broad Societal Benefits

- Benefits of digital mammography to medical facility users and patients are much greater than the benefits to the companies that produce them.
- Societal benefits include:
  - ° Increased throughput, reduced patient examination time, and reduced waiting time
  - ° Lower false positive rates, and therefore fewer unnecessary biopsies
  - ° Lower call-back rates for mammogram under- and over exposure, and therefore avoidance of unnecessary procedures
  - ° Reduced radiation exposure
  - ° Simplified record retrieval and record management of past mammograms
  - ° Assistance in use of computer-aided detection (CAD) for improved cancer detection
  - ° Reduced health disparities across population groups with greater use of telemammography and teleradiology networks

Appendix A: ATP Statute

[Note: The ATP statute originated in the Omnibus Trade and Competitiveness Act of 1988 (Pub. L. 100-418, 15 U.S.C. 278n) but was amended by the American Technology Preeminence Act of 1991 (Pub. L. 102-245).]

SUBPART C – ADVANCED TECHNOLOGY PROGRAM

SEC. 5131. ADVANCED TECHNOLOGY PROGRAM

(a) Advanced Technology Program. – The Act of March 3, 1901, as amended by this part, is further amended by adding after section 27 the following new section:

"ADVANCED TECHNOLOGY PROGRAM

"SEC.28.(a) There is established in the Institute an Advanced Technology Program (hereafter in this Act referred to as the 'Program') for the purpose of assisting United States businesses in creating and applying the generic technology and research results necessary to –

"(1) commercialize significant new scientific discoveries and technologies rapidly; and

"(2) refine manufacturing technologies.

ATP Manufacturing Support